MODEL 6120 SERIES Hydraulic Pumping Unit (HPU) W/Logo

INSTALLATION AND OPERATIONS MANUAL

B&B ARMR

Corporate Office & Tech Support:
2009 Chenault Drive
Carrollton, TX 75006
Suite 114
Phone: (972) 385-7899
Toll Free: (800) 367-0387
Fax: (972) 385-9887

E-mail: info@bb-armr.com
techsupport@bb-armr.com
www.bb-armr.com

MADE IN THE USA

Your safety is extremely important to us. If you have any questions or are in doubt about any aspect of the equipment, please contact us.

INTRODUCTION

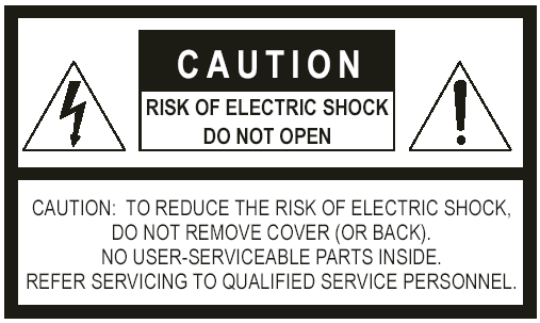
Welcome!

Congratulations on your purchase of a B&B ARMR Hydraulic Pumping Unit (HPU). In addition to providing detailed operating instructions, this manual describes how to install, maintain, and troubleshoot your HPU. If you require additional assistance with any aspect of your installation or operation, please contact us.

We have years of experience in all aspects of perimeter security and related disciplines, and our products are used throughout the world to control access and to protect people, equipment, and facilities. We offer a broad range of vehicle barrier and related security services:

- Turnkey installations
- Routine barrier preventative maintenance or emergency repairs (including work on non-B&B ARMR products)
- Spare or replacement parts
- Custom designs or special installations
- Equipment upgrades (modernize your old equipment with state-of-the-art hydraulics and control systems)
- Ancillary security equipment such as security guard enclosures, card readers, security lighting, and many other security related products.
- Technical support via telephone and possible on site support with advanced scheduling.

Safety


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

SYMBOL MEANING:

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of non-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instruction in the literature accompanying the product.

B&B ARMR does not assume responsibility for injury to persons or property during installation, operation, or maintenance. As the user, you are responsible for correct and safe installation, operation, and maintenance of this equipment. Users must follow the specific instructions and safety precautions located in this manual. In addition they must: Follow the safety standards of the Occupational Safety and Health Administration (OSHA), as well as other applicable federal, state, and local safety regulations and industry standards and procedures. For installation outside the United States, users must also follow applicable international, regional, and local safety standards.
Engage only trained and experienced staff to install, operate, and maintain the equipment. Ensure that all repairs are performed correctly, using properly trained technicians and the correct tools and equipment.

This HPU comes with a power ON/OFF switch. Although this switch does cut the power to the motor and various other devices, always use correct lock-out and safety procedures when servicing the unit. This unit is designed to be operated with the covers in place. Extreme caution should be used when operating without covers.

Additional system safety devices may be included with this barrier system:

- Vehicle loop detector(s) – Safety loop
- Traffic arms
- Traffic lights

How to Contact Us

If you have any questions or experience any problems with your vehicle barrier—or if we can help you with any other facility security issues—please contact us directly at:

Corporate/Tech Support:
B&B ARMR
2009 Chenault Drive Suite 114
Carrollton, TX 75006 USA
Telephone: (972) 385-7899
Toll Free: (800) 367-0387
Fax: (972) 385-9887
E-mail: **info@bb-armr.com**
techsupport@bb-armr.com

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1 ORIENTATION

1.1 Overview

The model 612x hydraulic pumping unit is designed to operate hydraulic barriers that require medium pressure and low flow. The electric motor is operated by a system pressure switch connected directly to a gear hydraulic pump which operates independently from the signal command. The oil from the pump is drawn through a filter and directed into a speed control valve through a directional control valve. The flow control valve monitors the operational speed of the barrier. The operating logic controls a series of manifolds and valves to ensure the correct position of the barriers based on input controls from any set of dry contacts.

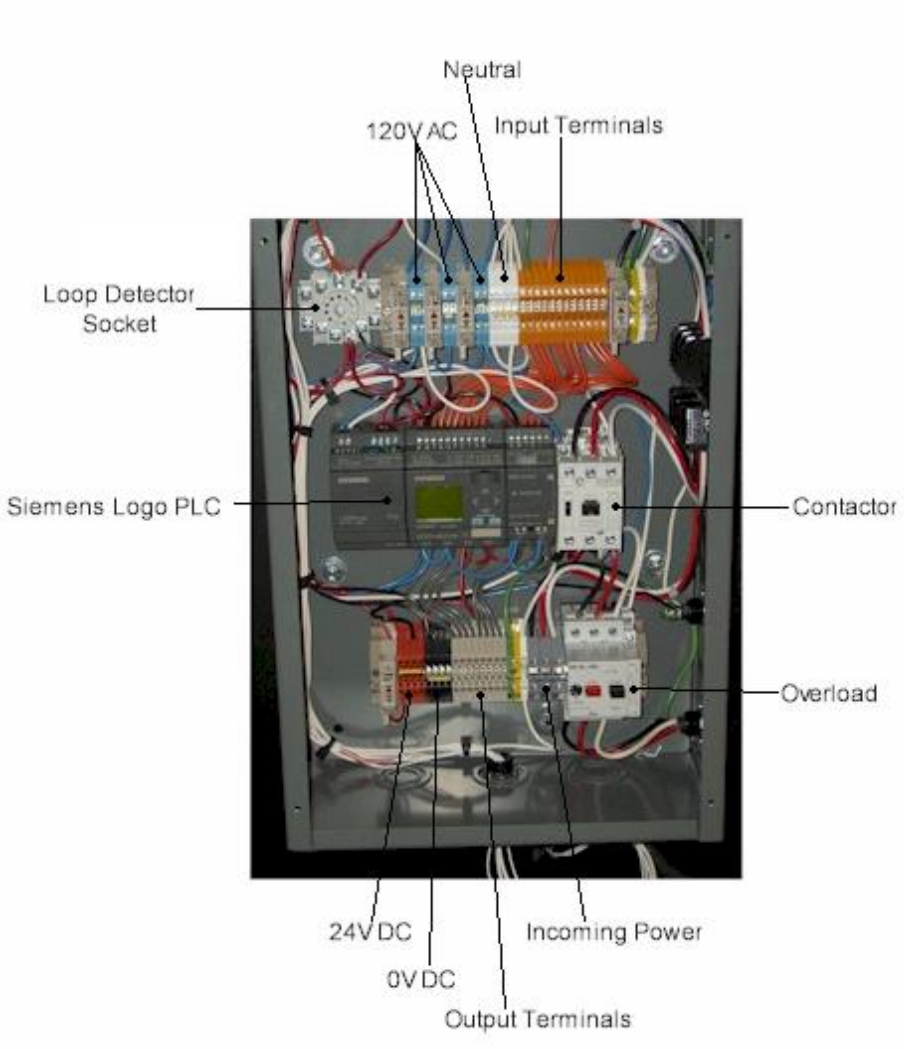
The HPU contains HIGH VOLTAGE components that can cause serious injury or death. Only trained service technicians should attempt any repair. Ensure at all times that proper safety lock-outs, barrier safety braces and all other safety systems are in place prior to any maintenance or service.

The HPU is a hydraulic system that can be under extreme pressure. Caution should be used when working in and around unit without proper covers in place.

1.1.1 Electrical Control Box

The electrical control box contains the electrical components and a programmable logic controller that is pre-programmed with the barrier's operating logic. The unit has a minimum 1.5 horsepower, 208 / 240-480 volt, three-phase motor. (A single-phase motor is available on special order.) An overload circuit protects the motor in the event of power fluctuations. The control unit is 120-volt, single-phase with 24-volt dc output. The key components of the electrical control box are shown in Figures 1-1a through 1-1c.

Figure 1-1a: Hydraulic Unit and Control System Electrical Box



1.1.2 Hydraulic System

The key components of the hydraulic unit are shown in Figures 1-1a through 1-1c. The motor powers a hydraulic pump that delivers oil through a series of valves as directed by the control unit. If the beam is in the up position for extended periods, the control circuit monitors any drift in the beam's position and automatically corrects the position. The unit includes a manual operation override so the beam can be raised and lowered during power outages.

1.1.3 System relief Valve

The system relief valve enables the system to be de-pressurized during maintenance and service operations.

Figure 1-1b: Hydraulic Unit Left Side View

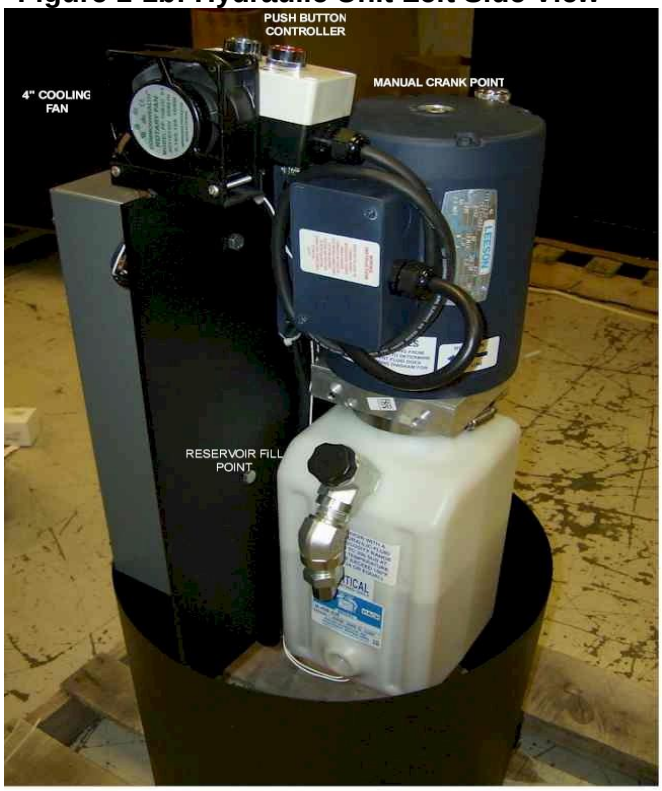


Figure 1-1c: Hydraulic Unit Right Side View

1.1.4 Cabinet

The pump cabinet houses the pumping unit components. The hydraulic pump enclosure is lockable. Typical environmental operation is between 0 F and 110 F. Typical enclosure is designed to provide a NEMA level 3R rating.

1.1.5 Options

The 612x series HPU's are available with a broad array of options and field installed kits. Consult your ordering documentation to determine whether your system has the optional equipment.

2 OPERATION

2.1 Introduction

The HPU is controlled via a variety of dry contact closures into the Programmable Logic Controller (PLC). Most common systems use a B&B ARMR supplied control panel. Please reference control panel user manual for specific control options.

2.2 Control Signals

The dry contact control signals are field connected based on optional equipment ordered per installation. For a detailed point to point connection, please refer to the site submittal prepared for the specific installation site.

2.3 Manual Operation

You can operate the HPU manually during a power outage as follows:

3.3.1 Turn the power switch to the OFF position (in case the power is suddenly restored).

3.3.2 Place a speed wrench on the screw head located on the top of the electric motor, and turn it in the direction of the arrow. This drives the hydraulic pump and raises the barrier.

3.3.3 To speed up raising the barrier you can drive the screw head on the motor with a cordless drill and socket.

NOTE: Do not turn or spin the motor in the reverse direction, as this will damage the hydraulic pump!

3.4.4 To lower the barrier, use the electric valve with the red knob that is located on the front of the pump below the motor and above the reservoir. To lower the barrier, push in the red knob and turn it counterclockwise. This action must be reversed to operate in normal condition.

Manual operation of the pump to raise and lower the barrier by-pass all safety lockouts and switches. Use extreme care when operating any barrier in the manual mode.

3 MAINTENANCE

Do not attempt repairs unless you are trained and qualified. This vehicle barrier can cause equipment damage and severe injury if it is operated or maintained improperly.

3.1 Introduction

The 612x Series HPUs are designed to be largely maintenance free. As with any complex electromechanical device however, they must be regularly inspected to ensure they are operating correctly. We recommend a simple monthly visual inspection and a more thorough biannual inspection as described below. Please contact B&B ARMR Technical Service Support for assistance with inspections, maintenance, or repairs if needed.
Component damage is likely if a vehicle strikes the barrier. If this occurs, contact B&B ARMR. We can help you assess the damage to make sure there is no hidden damage that will compromise safety or effectiveness and help you determine which components should be replaced.

3.2 Monthly Inspections

We recommend you perform the following visual inspections monthly on the barrier system. An equipment maintenance log is supplied in the appendix to assist in the logging.

- ❑ Inspect the condition of the finish. If rust is present, wire brush and sand the area then paint with a primer and a matching color.
- ❑ Vacuum and clean the pumping unit area.
- ❑ Check paint and touch up if required.
- ❑ Check oil for level and condition in the HPU (Recommended oil: Mobil EAL 224)
- ❑ If oil is contaminated, report and recommend replacement immediately (Recommended oil: Mobil EAL 224). Replacement requires authorization.
- ❑ Check barrier for operation through normal cycles.
- ❑ Adjust barrier speed to ensure proper operation. Check original submittal documents for normal operating speed for up and down.
- ❑ During the opening and closing cycles, verify the barrier operates smoothly and does not bind. Also verify that the barrier does not hit with excessive force when it contacts its full-open or full-closed positions. If necessary, adjust the barrier's speed.
- ❑ Check the hydraulic pumping unit for leaks at all points.
- ❑ Visually inspect the operation and electrical contacts.
- ❑ Tighten electrical contacts if required.
- ❑ Check, adjust, and tighten all sensors (limit switches, proximity switches).
- ❑ If applicable, check traffic lights and replace any burned bulbs or LEDs.
- ❑ Check safety devices (loop, IR, etc.) for proper operation and report any anomalies (if applicable).
- ❑ Check the PLC for normal operation of all logic and functions.
- ❑ Lubricate all pivot points and the clevis pin.
- ❑ Inspect the cylinder and report abnormalities.
- ❑ Check hoses for wear and report any abnormalities.

- ❑ Check the operation of the control panel(s).
- ❑ Check the control panel's buttons and lights for proper operation and replace if necessary.
- ❑ Update the operation and maintenance log.

3.3 Six-Month Inspections

We recommend you perform the following inspections every six months.

- ❑ Repeat the visual inspections in the monthly inspection list.
- ❑ Turn the master power switch on the control circuit box to the OFF position.
- ❑ Inspect the hydraulic system for signs of oil leaks.

CAUTION: The hydraulic system when in operation is under extreme pressure. Verify pressure on the barrier is completely relieved prior to removal of any hydraulic fittings.

- ❑ Check the hoses for wear or abrasion.
- ❑ Check all fittings for tightness.
- ❑ Measure the resistance in any traffic loops and log the measurements and report anomalies (if applicable).
- ❑ When the inspection is complete, turn the power on and test cycle the barrier to verify operation and control

3.4 Annual Maintenance Inspections

We recommend you perform the following inspections annually.

- ❑ Perform all monthly and six-month maintenance steps.
- ❑ Replace the hydraulic fluid.

3.5 Hydraulic Oil Changing Procedure

Follow the steps below to drain and refill the oil tank. We recommend using environmentally safe oil such as Mobil EAL 224. Refer to the drawing titled *Assembly Drawing (120-2001* see the Engineering Drawings section at the end of this manual).

4.4.1 Drain the reservoir using a pump and remove the fluid with the gate in the down position.

4.4.2 Refill the reservoir with the same fluid used previously to about 5-6" from the top of the reservoir.

4 TROUBLESHOOTING

The table below provides a general guidance on identifying and correcting any problems with your 612x Series HPU. If you encounter problems that you cannot fix, contact B&B ARMR and we will gladly work with you to correct them.

4.1 612x Series HPU Troubleshooting Guide

The table below provides guidance on identifying and correcting any problems with your 611x series HPU. Please refer to the barrier manual for more detailed troubleshooting guides. If you encounter problems that you cannot fix, contact B&B ARMR and we will gladly work with you to correct them.

Symptom	Actions
Barrier does not raise up when commanded on control panel	1. Check power 2. Check for binding. 3. Check overload protector 4. Manually raise the barrier to see if problem is mechanical or electrical (see section 3.3). 5. Check PLC input on pumping unit. 6. Check that safeties are clear. 7. Check PLC output on pumping unit 8. Check push button operation 9. Check that speed valves are open.
Barrier does not close when commanded on control panel	1. Check power 2. Check for binding. 3. Check overload protector 4. Manually lower the barrier to see if problem is mechanical or electrical (see section 3.3). 5. Check PLC input on pumping unit. 6. Check that safeties are clear. 7. Check PLC output on pumping unit 8. Check push button operation 9. Check that speed valves are open.
HPU pump will not turn on	1. Check power 2. Check motor overload, press start. Check motor starter.
Hydraulic unit excessively hot	1. Check that the fan is operating properly. 2. Check for correct voltages.
Barrier moves too slowly	1. Check for mechanical binds. 2. Check flow control valve. 3. In extreme cold temperatures, a higher grade hydraulic fluid may be required to keep viscosity constant.

5 WARRANTY

BBRSS warranties for a period of one (1) year FOB manufacturing facility, unless otherwise specified by BBRSS in writing, from defects due to faulty material or workmanship. Damage due to handling during shipment and installation are not covered under warranty. BBRSS assumes no responsibility for service at customer site. BBRSS is in no event responsible for any labor costs under the warranty. Subject to the above limitation, all service, parts, and replacements necessary to maintain the equipment as warranted shall be furnished by others. BBRSS shall not have any liability under these specifications, other than for repair or replacement as described above for faulty product material or workmanship. Equipment malfunction or equipment failure of any kind, caused for any reason, including, but not limited to unauthorized repairs, improper installation, installation not performed by BBRSS authorized personnel, incoming supply power is outside the tolerance for the product, failure to perform manufacturer's suggested preventative maintenance, modifications, misuse, accident, catastrophe, neglect, natural disaster, are not under warranty.

The exclusive remedy for breach of any warranty by BBRSS shall be the repair or replacement at BBRSS's option, of any defects in the equipment. **IN NO EVENT SHALL BBRSS BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES OR ANY KIND OF PERSONAL DAMAGES.** Except as provided herein, BBRSS makes no warranties or representations to consumer or to anyone else and consumer hereby waives all liability against BBRSS as well as any other person for the design, manufacture, sale, installation, and/or servicing of the Products.

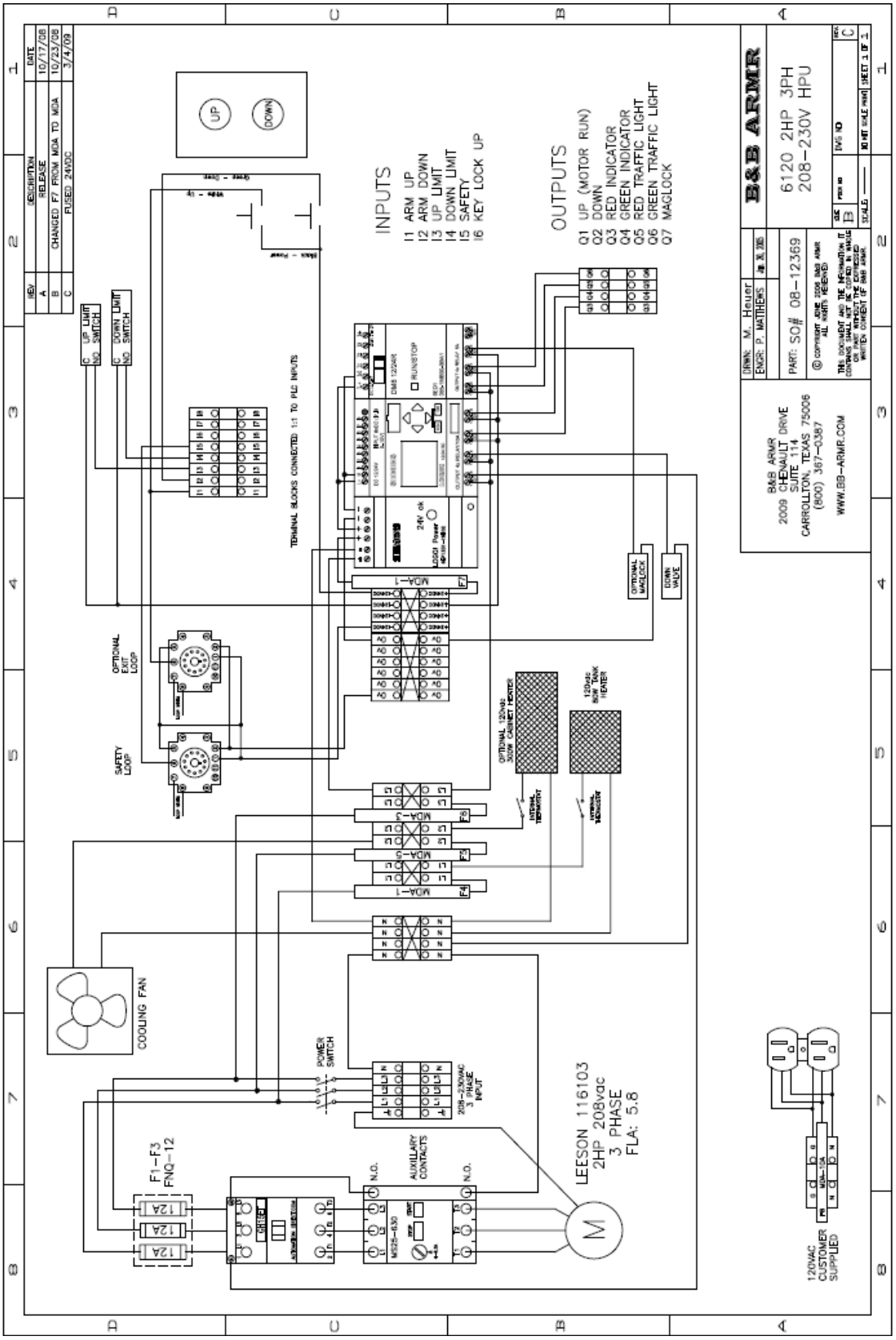
THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO OTHER WARRANTIES EXIST.

Any modification or alteration by anyone other than BBRSS will render the warranty herein as null and void.

6 APPENDIX

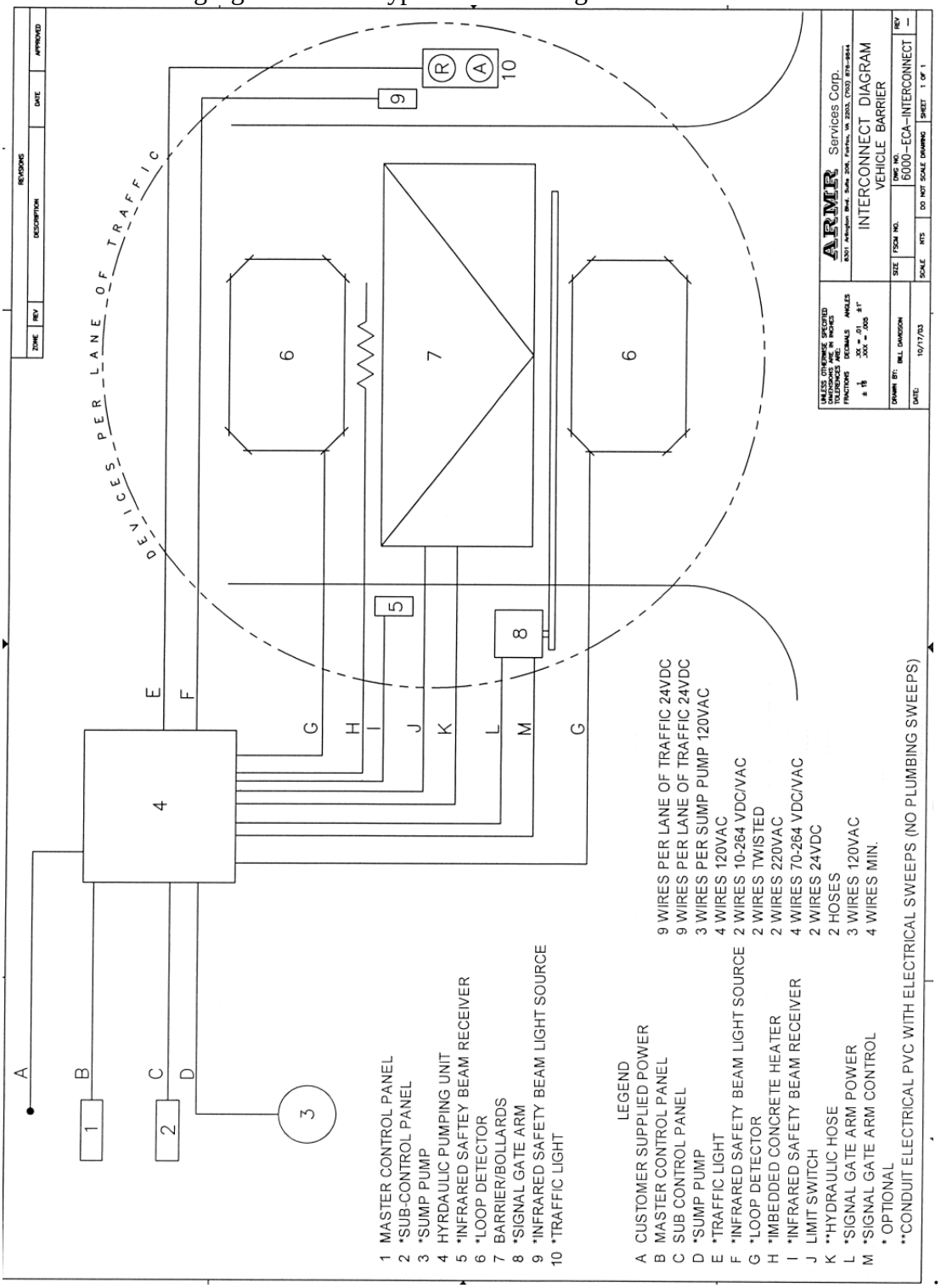
6.1 Electrical Schematic Diagram

The following figure shows a typical electrical schematic for a 612x HPU. The schematic shown is for a typical single lane barrier system.


INPUTS
I1 ARM UP
I2 ARM DOWN
I3 UP LIMIT
I4 DOWN LIMIT
I5 SAFETY
I6 KEY LOCK UP
OUTPUTS
Q1 UP (MOTOR RUN)
Q2 DOWN
Q3 RED INDICATOR
Q4 GREEN INDICATOR
Q5 RED TRAFFIC LIGHT
Q6 GREEN TRAFFIC LIGHT
Q7 MAGLOCK
UP
DOWN
C UP LIMIT NO SWITCH
C DOWN LIMIT NO SWITCH
TERMINAL BLOCKS CONNECTED 1:1 TO PLC INPUTS
OPTIONAL MAGLOCK
DOWN VALVE
OPTIONAL EXIT LOOP
SAFETY LOOP
OPTIONAL 120vac 300W CABINET HEATER
120vac 50W TANK HEATER
COOLING FAN
POWER SWITCH
208-230VAC 3 PHASE INPUT
F1-F3 FNQ-12
12A
AUXILIARY CONTACTS
N.O.
N.O.
LEESON 116103
2HP 208vdc
3 PHASE
FLA: 5.8
M
120VAC CUSTOMER SUPPLIED
B&B ARMR
6120 2HP 3PH
208-230V HPU
PART: SO# 08-12369
B&B ARMR
2009 CHENAULT DRIVE
SUITE 114
CARROLLTON, TEXAS 75006
(800) 367-0387
WWW.BB-ARMR.COM
DRWN: M. Heuer
ENGR: P. MATTHEWS
DATE
10/17/08
10/23/08
3/4/09
DESCRIPTION
RELEASE
CHANGED F7 FROM MDA TO MDA
FUSED 24VDC
REV
A
B
C

6.2 Electrical Field Wiring Diagram

The following figure shows a typical field wiring schematic for a 612x HPU.


DEVICES PER LANE OF TRAFFIC
1 MASTER CONTROL PANEL
2 *SUB-CONTROL PANEL
3 *SUMP PUMP
4 HYRDAULIC PUMPING UNIT
5 *INFRARED SAFTEY BEAM RECEIVER
6 *LOOP DETECTOR
7 BARRIER/BOLLARDS
8 *SIGNAL GATE ARM
9 *INFRARED SAFETY BEAM LIGHT SOURCE
10 *TRAFFIC LIGHT
LEGEND
A CUSTOMER SUPPLIED POWER 9 WIRES PER LANE OF TRAFFIC 24VDC
B MASTER CONTROL PANEL 9 WIRES PER LANE OF TRAFFIC 24VDC
C SUB CONTROL PANEL 3 WIRES PER SUMP PUMP 120VAC
D *SUMP PUMP 4 WIRES 120VAC
E *TRAFFIC LIGHT 2 WIRES 10-264 VDC/VAC
F *INFRARED SAFETY BEAM LIGHT SOURCE 2 WIRES TWISTED
G *LOOP DETECTOR 2 WIRES 220VAC
H *IMBEDDED CONCRETE HEATER 4 WIRES 70-264 VDC/VAC
I *INFRARED SAFETY BEAM RECEIVER 2 WIRES 24VDC
J LIMIT SWITCH 2 HOSES
K **HYDRAULIC HOSE 3 WIRES 120VAC
L *SIGNAL GATE ARM POWER 4 WIRES MIN.
M *SIGNAL GATE ARM CONTROL
* OPTIONAL
**CONDUIT ELECTRICAL PVC WITH ELECTRICAL SWEEPS (NO PLUMBING SWEEPS)
ARMR Services Corp.
INTERCONNECT DIAGRAM
VEHICLE BARRIER
6000-ECA-INTERCONNECT

6.3 Equipment Maintenance Log Form

Product Type:_____

Location:_____

B&B ARMR
800-367-0387
servicedept@bb-armr.com

	Date	Performed By	Checklist Complete	Anomalies	Notes
Jan			Yes No		
Feb			Yes No		
Mar			Yes No		
Apr			Yes No		
May			Yes No		
Jun			Yes No		
Jul			Yes No		
Aug			Yes No		
Sep			Yes No		
Oct			Yes No		
Nov			Yes No		
Year			Yes No		

	Date	Performed By	Checklist Complete	Anomalies	Notes
Jan			Yes No		
Feb			Yes No		
Mar			Yes No		
Apr			Yes No		
May			Yes No		
Jun			Yes No		
Jul			Yes No		
Aug			Yes No		
Sep			Yes No		
Oct			Yes No		
Nov			Yes No		
Year			Yes No		